

# UDOT MAINTENANCE FACTS

June 2008

UDOT maintained roads lead into every National Park, National Monument, and National Recreation Area in Utah. State highways serve every ski area in the state.

## SYSTEM FACTS

Miles of highways maintained by UDOT: **5,840 miles**

Miles of Interstate Highways **971 miles**

Lane-miles maintained by UDOT **16,256 lane-miles**

1 lane-mile = 1 mile of road 12 feet wide

Amount of pavement maintained by UDOT **24,143 surface areas**

1 surface area = 1 mile of road 12 feet wide

(all pavements must be cared for – traffic lanes get first priority)

## UDOT MAINTAINS

- 94,924 signs
- 2,700 large overhead signs
- 375,000 delineators
- 60,000 culverts
- 1,670 bridges
- 2,500 miles of fence
- 40 rest areas
- 100,000 acres of roadside vegetation
- 600 miles of guardrail
- 2,000 miles of ditches and
- 1 ferry boat

## LONG TERM PAVEMENT MAINTENANCE

Our maintenance program is based on the idea “*Good Roads Cost Less*” – Keeping a road in good shape is less costly in the long term than letting it deteriorate and then try to fix everything at once.

On average, we spent \$3,800 per year per lane-mile of road for fixing roads

We spend another \$7,200 per year for every lane-mile on the system for rehabilitation or preservation of road pavements so they won't deteriorate faster.

Much of the “construction” we see around the state is actually maintenance work . . . Fixing potholes, sealing cracks, renewing pavement surface so cars and trucks have better “Skid Resistance”, preserving pavements by adding protective layers, and adding new pavement layers for added strength.

### Why do roads deteriorate?

Traffic – heavy truck and automobile traffic causes wear

Water – water seeps under the pavement and makes the earth underneath soft

Erosion – water erodes slopes and pipes

Crash damage

Freezing and thawing during the winter – this can break concrete and asphalt.

## EQUIPMENT FACTS

We have 493 trucks equipped with snow plows

We use about 1500 snow plow blade edges per year

This year (2008) we will purchase 27 new trucks and retire 27 trucks

Trucks are scheduled for replacement on an average of every fourteen years

We use about 1100 other specialized pieces of equipment such as message boards, paint trucks, giant snow blowers, front-end loaders, road graders, oil spreaders, and boom trucks

We lease most of our tractors used for mowing. The equipment Division is constantly looking for ways to stretch equipment purchase money.

All new front-end loaders are purchased on a guaranteed dealer buy-back program that reduces ownership costs.

We used 2, 056,000 gallons of diesel fuel last year.

## **PERSONNEL FACTS**

542 permanent full-time employees and about 30 winter seasonal employees maintain the state highway system at 79 maintenance stations and a number of sub-stations.

29 special maintenance crews take care of bridges, highway painting, signs, weed control, guardrail and also plow snow in the winter

The most remote maintenance station is located at Garrison, Utah, located near the Nevada border west of Delta. It's a two-hour drive to the nearest doctor or supermarket and 3 hours to the nearest pizza parlor.

Bluff Maintenance Station is 329 miles southeast of Salt Lake City

## **WINTER MAINTENANCE and SNOW REMOVAL**

UDOT moves about 65,000,000 tons of snow off the road in a typical winter

A typical snow season costs \$18,000,000 for snow removal on state highways. Last year we spent a little less, but a year with heavy snow may cost more than \$20,000,000.

Salt is **NOT** used to melt snow; rather it is used to keep snow and ice from bonding to the pavement

UDOT uses plowing, anti-icing, prewetting, and deicing to manage winter road conditions

Interstate routes and urban arterial streets receive highest priority for snow removal while five routes with low summer traffic volumes are closed for the entire winter.

UDOT uses primarily common salt to de-ice and anti-ice roads. We also use magnesium chloride and potassium acetate in smaller quantities.

## Application

Typical application rates for dry salt are 250 pounds per lane-mile. A lane mile is a section of road 12 feet wide by 5,280 feet or 66,360 square feet.

This rate is 0.0039 pounds of salt per square foot or 0.06 ounces or 1/8 teaspoon per square foot.

Applying liquid salt (salt brine) in carefully controlled amounts and under controlled conditions (about 50 pounds per lane-mile) reduces the amount of salt needed to keep ice from forming. Brine is applied directly to the surface and is not allowed to run off. Salt is only placed where it is needed.

Sodium Chloride salt loses its ability to melt ice at low temperatures. At 20 deg F it takes three times as much salt to melt a pound of ice than it took at 31 deg f. At -5 deg F sodium chloride will not melt ice.

Experience has shown that sodium chloride salt that is normally solid is easy to store, inexpensive, and effective when used in the correct quantities and at the correct temperature.

## Salt Sources

UDOT salt comes from

- Solar evaporation ponds located north of Grantsville (Morton Salt Company),

- Solar evaporation ponds at IMAX, north of I-80 near Grantsville (Broken Arrow),
- Solar evaporation ponds west of Ogden at Little Mountain (North American Salt).
- Rock salt from underground mines at Redmond, Utah (Redmond Minerals) makes up about 30% of our usage statewide.

As with any bulk commodity, haul costs determine which products are used in what area. In northern Utah the majority of the salt used is from the Great Salt Lake. In southern and eastern Utah most salt used comes from Redmond, Utah.

Magnesium chloride comes from evaporation ponds operated by North American Salt west of Ogden and is used in small amounts.

We also use a very small quantity of potassium acetate from a manufacturer in Iowa for anti-icing on the bridges at I-215 and State Route 210 (Knudsen's Corner) as part of a test of advanced anti-icing techniques.

## Preparing for winter

We purchase only enough salt for anticipated needs. We try to limit salt sitting in storage areas. Salt is ordered throughout the winter on an as-needed basis.

UDOT uses about 200,000 tons of salt, 75,000 cubic yards of deslicking grit, 1,750,000 gallons of salt brine, 40,000 gallons of magnesium chloride and 2,500 gallons of potassium acetate.

“Snow Schools” are held in each region to refresh plow drivers skills and plan for the season. A particular concern of Snow School is insuring consistency between roads maintained by adjoining maintenance stations